

Remarks

The Office Action mailed December 28, 2005 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-67 are now pending in this application. Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 are rejected. Claims 1, 4, 31, 33, 54 and 58 have been amended. Clams 67 has been newly added. No new matter has been added. No fees are due for the newly added claim.

Applicants respectfully submit that Claim 66 was added in an amendment mailed January 4, 2005. However, no examination of Claim 66 has been provided. Applicants respectfully request the examination of Claim 66.

The rejection of Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 under 35 U.S.C. § 103(a) as being unpatentable over Bessler et al. (U.S. Patent No. 5,410,230), in view of Alford (U.S. Patent No. 5,220,255) and Kliman et al. (U.S. Patent No. 6,262,550) is respectfully traversed.

Bessler et al. describe a microprocessor (302) that provides a speed or torque control signal via a line (308) to an electronically commutated motor (ECM) (310) to control the speed or torque of the motor (column 5, lines 55-60). The microprocessor constitutes a control means responsive to a temperature signal on a bus (204) provided by a thermostat (202) (column 6, lines 11-13). The microprocessor receives the temperature signal and monitors a cyclic parameter of the temperature signal to generate a motor control signal provided via the line (308) as a function of the monitored cyclic parameter (column 6, lines 13-17). The control signal provided via the line (308) is provided to the ECM as a motor control signal to control a torque or speed of the motor (column 6, lines 18-20).

Alford describes an interface (10) that provides an ENABLE signal at an on/off input (50), a HEATING signal at a heating input (52), and a RATE signal at a high/low input (54) (column 3, lines 61-66). The ENABLE signal has a waveform and it is derived directly from fan or heat signals (Figure 5(b), column 4, lines 23-27).

Kliman et al. describe a pair of monitoring units (12, 14) that are connected by a communication link (20), which may be a high-speed bus that is a hard-wired Ethernet network or a wireless path, such as a radio or optical local-area-network (LAN) (column 5, lines 16-21). Each of the monitoring units includes a central processor unit (column 5, lines 45-50). The monitoring unit (12) acquires data signals from a Stimulus and Measurement Instrumentation unit (22), which in turn captures signals from sensors that are in contact with a motor or in an immediate vicinity of the motor (column 6, lines 19-24).

Claim 1 recites a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, the method comprising the steps of "...converting, by the interface circuit, the first signal received from the controller to generate a second signal including a digitally encoded signal and at least one of an infrared signal and a radio frequency (RF) signal, wherein the controller is coupled via the interface circuit to a microcontroller located within the electric motor comprising an electronically commutated motor; outputting the second signal to control the electric motor, wherein said outputting the second signal comprises outputting, by the interface circuit, the digitally encoded signal to the microcontroller within the electronically commutated motor..."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest a method for interfacing an electric motor to a controller as recited in Claim 1. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest outputting the second signal to control the electric motor, where outputting the second signal comprises outputting, by the interface circuit, the digitally encoded signal to the microcontroller within the electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal and monitoring a cyclic parameter of the temperature signal to generate a motor control signal provided via a line to an electronically commutated motor. Accordingly, Bessler does not describe or suggest the digitally encoded signal. Alford describes providing an ENABLE signal at an on/off input. The ENABLE signal has a waveform and it is derived directly from fan or heat signals. Accordingly, Alford does not describe or suggest the digitally encoded signal. Kliman et al. describe capturing, by a Stimulus and Measurement Instrumentation unit,

signals from sensors that are in contact with a motor or in an immediate vicinity of the motor. Accordingly, Kliman et al. does not describe or suggest outputting the digitally encoded signal to the microcontroller within the electronically commutated motor. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests outputting, by the interface circuit, the digitally encoded signal to the microcontroller within the electronically commutated motor. For the reasons set forth above, Claim 1 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 2 and 4-11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2 and 4-11 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 4-11 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 31 recites an electrical interface circuit comprising "...said electrical interface circuit further configured to convert a voltage signal to a digitally encoded signal and at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electric motor comprising an electronically commutated motor, wherein said electrical interface circuit configured to output the digitally encoded signal to the microcontroller within the electronically commutated motor..."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit as recited in Claim 31. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest the electrical interface circuit configured to output the digitally encoded signal to the microcontroller within the electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal and monitoring a cyclic parameter of the temperature signal to generate a motor control signal provided via a line to an electronically commutated motor. Accordingly, Bessler does not describe or suggest the digitally encoded signal. Alford describes providing an ENABLE signal at an on/off input. The ENABLE signal has a waveform and it is derived directly from fan or heat signals. Accordingly, Alford does not describe or suggest the digitally encoded signal. Kliman et al. describe capturing, by a Stimulus and Measurement Instrumentation unit, signals from sensors that are in contact with a motor or in an immediate vicinity of the motor. Accordingly, Kliman et al. does not describe or suggest the electrical interface circuit configured to output to the microcontroller

within the electronically commutated motor. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit configured to output the digitally encoded signal to the microcontroller within the electronically commutated motor. For the reasons set forth above, Claim 31 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 32-44 and 46-48 depend, directly or indirectly, from independent Claim 31. When the recitations of Claims 32-44 and 46-48 are considered in combination with the recitations of Claim 31, Applicants submit that dependent Claims 32-44 and 46-48 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 54 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising "...said electrical interface circuit configured to convert a voltage signal to a digitally encoded signal and at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electronically commutated motor, wherein said electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor..."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 54. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest the electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal and monitoring a cyclic parameter of the temperature signal to generate a motor control signal provided via a line to an electronically commutated motor. Accordingly, Bessler does not describe or suggest the digitally encoded signal. Alford describes providing an ENABLE signal at an on/off input. The ENABLE signal has a waveform and it is derived directly from fan or heat signals. Accordingly, Alford does not describe or suggest the digitally encoded signal. Kliman et al. describe capturing, by a Stimulus and Measurement Instrumentation unit, signals from sensors that are in contact with a motor or in an immediate vicinity of the motor. Accordingly, Kliman et al. does not describe or suggest the electrical interface circuit configured to communicate to the microcontroller within the electronically commutated

motor. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor. For the reasons set forth above, Claim 54 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 55-57 depend from independent Claim 54. When the recitations of Claims 55-57 are considered in combination with the recitations of Claim 54, Applicants submit that dependent Claims 55-57 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 58 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising "...said electrical interface circuit configured to convert a voltage signal to a digitally encoded signal and at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electronically commutated motor, wherein said electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor..."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 58. Specifically, none of Bessler et al., Alford, or Kliman et al., alone or in combination, describe or suggest the electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal and monitoring a cyclic parameter of the temperature signal to generate a motor control signal provided via a line to an electronically commutated motor. Accordingly, Bessler does not describe or suggest the digitally encoded signal. Alford describes providing an ENABLE signal at an on/off input. The ENABLE signal has a waveform and it is derived directly from fan or heat signals. Accordingly, Alford does not describe or suggest the digitally encoded signal. Kliman et al. describe capturing, by a Stimulus and Measurement Instrumentation unit, signals from sensors that are in contact with a motor or in an immediate vicinity of the motor. Accordingly, Kliman et al. does not describe or suggest the electrical interface circuit configured to communicate to the microcontroller within the electronically commutated

motor. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit configured to communicate the digitally encoded signal to the microcontroller within the electronically commutated motor. For the reasons set forth above, Claim 58 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

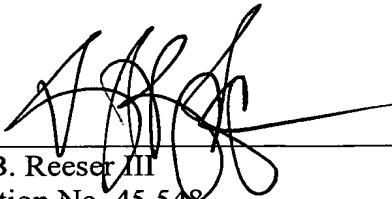
Claims 59-60 and 62-65 depend from independent Claim 54. When the recitations of Claims 59-60 and 62-65 are considered in combination with the recitations of Claim 58, Applicants submit that dependent Claims 59-60 and 62-65 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 be withdrawn.

Newly added Claim 67 depends from independent Claim 1, which is submitted to be in condition for allowance and is patentable over the cited art. For at least the reasons set forth above, Applicants respectfully submit that Claim 67 are also patentable over the cited art.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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